Aftershock of the technology boom

Sharon Schmickle / Star Tribune (Minneapolis- St. Paul)

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In a dilapidated building on the edge of downtown Minneapolis, workers confront a version of the electronic era that rarely appears in the high-flying visions of a digital universe.

This graveyard for computers, VCRs, TVs and other electronic junk -- debris of the technology that is propelling the economy and is transforming homes, jobs and shopping malls -- is eerie because it's starkly out of synch with the dazzling hyperbole of the Information Age.

Here the boom in consumer electronics comes down to these dreary basics: bins overflowing with broken circuit boards, carts full of lead-laden monitors and huge piles of unwanted plastic.

Hennepin County spent nearly $18 a unit -- about $500,000 in all -- last year to dismantle e-junk and ship it to recyclers. But that is only a beginning. When county officials look to the future, they see an electronic avalanche tumbling toward landfills and overwhelming their budgets.

Consider personal computers alone: Americans will throw away 61 million of them a year by 2007, up from about 20 million last year, according to a study conducted by the National Safety Council.

"There is too much unacceptable material to let it go into the waste stream, but it shouldn't become a tax bite either," said Philip Eckhert, director of Hennepin County's environmental services. "Who should pay for processing all of this? The manufacturer? The retailer? The consumer?"

The question echoes through the offices of electronics corporations as European countries consider laws requiring manufacturers to take back their products after they wear out.

But manufacturers don't quite know what to do with scrap from spent electronic appliances either, especially the plastic, said David Thompson, who heads the corporate environmental department of Matsushita Electric Corp. of America, which manufactures in the West under the Panasonic brand.

"We're facing some pretty serious challenges here," Thompson said. "I don't think any of us are very comfortable that we have a recycling solution in place or even a light at the end of the tunnel for the plastics that are contained in these products."

Nevertheless, Minnesota -- considered a national leader in the search for solutions -- is working with Matsushita and other companies to evaluate recycling options.

A throw-away culture

Major environmental benefits have come with the spread of electronics into homes and offices. Computerized furnaces and cars, for example, have helped conserve energy and clean up the nation's air. Matsushita estimates that such features in one of its refrigerators have cut the appliance's energy use by 15 percent since 1996 while also expanding the space for food. Makers of a broad range of appliances boast similar energy savings.

But the downside is just coming into focus as consumers get rid of the gizmos they bought during an electronic boom in the 1980s and '90s. It isn't just computers, microwaves and VCRs. Commonplace items from toys to coffee pots have acquired electronic features during the past two decades.

The creep of electronics into everyday items has accelerated the throw-away culture. Few consumers know how these things work. And falling prices have made them ever cheaper to replace. So instead of running for the screwdriver or even the repair shop when things break down, people throw them away.

Indeed, many small appliances are no longer made to be repaired, said Gary Katz, President and CEO of A-ABC Appliance & Heating in Minneapolis. Except for a shell and push buttons, a wired circuit board often makes up the bulk of the appliance.

"They don't just control it," he said. "They are it."

The potential uses for old computers are shrinking too. The first PCs were recycled informally as pioneers sold their earliest models or passed them off to relatives, charities and schools. But falling prices and rapid turnover in technology are pushing more and more older models toward the trash.

Plastics

The worries about throw-away electronics start with plastics. The National Safety Council has called them "the most challenging materials to recycle from electronic equipment."

Some plastic is recycled into construction materials, outdoor furniture and other products. But dozens of different types of plastics go into appliances, and sorting through them can be difficult. Therefore recyclers shy away from mystery mixes of the stuff.

Also, some of these plastics defy recycling to begin with -- the flame retardants in television casings, for example, can be toxic chemicals.

Virtually everyone in the recycling business is looking for a solution to the plastics problem, said Mary Olson, president of Materials Processing Corp., in Eagan, a private recycler of computers and other electronic refuse.

But economics alone make the quest daunting.

"The virgin plastic does not cost that much more than the recycled plastic, and manufacturers don't want to take a chance on contaminating their products," Olson said.

Materials Processing and other recyclers send plastic to Northern States Power to be burned for electricity generation. Hennepin County also burns plastic to generate electricity, but it can't take any more plastic because it already is operating at maximum capacity.

The smoke from the county's burner is substantially below levels that are considered air polluting, said Cheryl Lofrano-Zaske, a planning analyst for county environmental services.

A second major worry lurks behind the screens of televisions and computer monitors. They house cathode ray tubes that contain lead for a good reason: to shield users from radioactivity.

But benefit gives way to liability when the CRTs hit the landfills. They recently have become the second-largest source of lead in Minnesota's waste stream, after auto batteries, said Tony Hainault, a policy analyst at the Minnesota Office of Environmental Assistance.

One CRT contains four to seven pounds of lead, said Eckhert in Hennepin County. Getting rid of it is the biggest expense -- about $10 a unit -- in the county's cost of recycling a computer or a television, he said.

Circuit boards

Taken alone, a circuit board containing the microchips and related wiring that give brains to everything from computers to smoke detectors would not be of major concern at a landfill.

"But there are so many of them," said Ted Smith, executive director of the Silicon Valley Toxics Coalition, which pushes for cleaning up the chemical processes used in making the boards.

"One or two or 10 or a hundred may not be that big a deal, but when you are talking billions of them, it becomes a very big deal," he said.

Most boards contain a variety of metals -- some highly valued by recyclers, some dreaded at landfills. One worry is lead used for solder and protective finish. Although the amount per board is small, the board-making industry wants to eliminate it, said David Bergman, a vice president at the industry's IPC Institute in Illinois.

But electronics manufacturers continue to specify lead coating and solder in their orders for boards, he said, because it is known to do the job well and new alternatives are relatively unknown.

"I'll probably get killed for saying this, but 100 percent of it could be eliminated," Bergman said. "The only reason that it is there is because the customer is still calling for it."

Exploring options

One obstacle to recycling electronic devices is the labor involved in tearing down and sorting their contents. Hennepin County contracts for this purpose with PPL Industries, a nonprofit company that specializes in job training for hard-to-employ workers. Immigrants, those with chemical dependencies or those recently released from prisons or other institutions are among the 33 or so workers at PPL's worksite on Portland Avenue. They earn about $5.50 an hour plus piecework pay.

Statewide, Minnesota is running a pilot project this year with funding and other support from Sony Electronics Inc., Matsushita, the American Plastics Council and the Waste Management-Asset Recovery Group. Household electronics were collected at 30 Minnesota locations from August through October. Now the scrap is being assessed for its recycling value at facilities in California, Pennsylvania and elsewhere, Hainault said.

One reason electronics companies are eager to work with state and local governments is the movement overseas to force manufacturers to take back and recycle their worn-out products. The European Commission is refining a proposal to start doing that in 2004. It also plans to ban the use of lead and certain other substances in the products. In Japan, consumers pay recycling fees when they buy TVs and household appliances (about $20 for a TV), and manufacturers or recyclers have to accept the discarded products.

American manufacturers maintain that it's more efficient to channel the recycling through existing trash networks.

"Municipal governments have always collected trash," said Doug Smith, Sony's director of corporate environmental affairs. "Now they collect recyclables. None of this is new. . . . We don't want to tack costs onto our products and have to collect them at the end of life."

But Europe's move raises questions that Americans should consider, said Smith at Silicon Valley Toxics Coalition. One of them is whether we "really need all of this stuff to begin with." Another is the "mad rush to develop products faster and faster" with no time to consider the environmental implications.

"All of the money is focusing on the innovation," he said. "There is not a lot of money to be made in raising all of these other issues. They don't arise until later on. And then we are having to clean up the mess that we made through earlier generations of mistakes."